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Before the  
**Federal Communications Commission**  
Washington, D.C. 20554

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**JUN 23 1997**

FEDERAL COMMUNICATIONS COMMISSION  
OFFICE OF THE SECRETARY

In the Matter of	)	
	)	
Amendment of Section 2.106 of the	)	ET Docket No. 95-18
Commission's Rules to Allocate	)	RM-7927
Spectrum at 2 GHz for Use by	)	PP-28
the Mobile-Satellite Service	)	

### COMMENTS OF THE AFFILIATED AMERICAN RAILROADS

The Affiliated American Railroads, by their undersigned counsel, hereby respond to the Commission's invitation for comments on the Further Notice of Proposed Rule Making in the above-captioned proceeding, released March 14, 1997 (hereinafter "Further Notice").

#### I. BACKGROUND AND STATEMENT OF INTEREST

The railroad industry has been an active participant herein from the inception of this proceeding, owing to its heavy reliance on point-to-point fixed service (FS) microwave systems used to carry voice and data traffic which is integral to the minute-to-minute management and control of train movements throughout the nation's rail network.<sup>1/</sup> Many of these FS links are in portions of the 2.1 GHz band which the Commission reallocated for use by the Mobile Satellite Service ("MSS") in the First Report and Order in this proceeding. According to a study by the Commission's

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1/ See AAR's Comments filed May 5, 1995; AAR's Reply Comments filed June 21, 1995; and AAR's Response to Comsat's Supplemental Comments filed May 17, 1996.

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Office of Engineering and Technology, there are 991 FS microwave facilities operated by railroads in the bands 2130-2150 MHz and 2180-2200 MHz.<sup>2/</sup>

These radio systems are vital to ensuring safety on the nation's railroads. As shown schematically on the diagram attached as Attachment A, a combination of FS links and mobile radio channels are used for transmitting voice and data communications to and from crews in locomotives and for controlling and monitoring rail switches and signals. The FS links are used to interconnect the trackside radio facilities (both mobile and fixed) with the centralized dispatching center in each railroad's operating region. For example, a locomotive travelling on Union Pacific's right-of-way in Nevada is in contact, via mobile radio and FS links, with the UP centralized dispatch and control center located hundreds of miles away in Omaha, Nebraska; similarly, Jacksonville, Florida is the center of operations for trains on the CSX network, which covers the Southeast, Mid-central and Middle Atlantic regions of the nation.

FS microwave circuits, many operating in the 2.1 GHz band, are integral links in this nationwide railroad communications system. These links carry communications to advise of dangerous conditions and, if necessary, bring railroad operations to a halt to prevent unsafe operations. Radio communications between trains and central dispatchers are essential to protect railroad employees and the general public. Only radio can provide immediate information on the location, direction and speed of

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<sup>2/</sup> "Creating New Technology Bands For Emerging Telecommunications Technology," Federal Communications Commission, Office of Engineering and Technology, OET/TS 92-1 at 8 (1992).

hundreds of trains operating at the same time on each major railroad in the country. This information is indispensable to railroad safety. In this regard, a 1994 study by the Federal Railroad Administration reviewed in detail the various types of railroad communications systems, including those used for train movement and control, switching operations, defect detection and emergency response, and concluded that radio communications were an integral part of railroad safety planning and execution.<sup>3/</sup>

These operations and safety uses are absolutely critical to the safe operation of railroads and cannot be jeopardized by interference from other spectrum users,

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3/ Railroad Communications and Train Control, Federal Railroad Administration, Department of Transportation Report to Congress, July 1994 at 22-34 (hereafter FRA Report). Specific examples of railroads' use of radio for safety include telemetry systems for remote control and defect detection which utilize mobile and fixed-microwave frequencies to perform critical safety functions. Hot journal detectors measure the temperature of the axle bearings of a railroad car as it passes over the detector. A radio transmission using land mobile frequencies then alerts the train crew to stop the train and inspect the journal to determine whether to remove the car in question or proceed at reduced speed. Similarly, hot wheel detectors identify railroad cars with malfunctioning brakes, which could lead to fires or other unsafe conditions; high-wide detectors are used to detect shifted cargo on a passing train and give warning prior to entry into tunnels; dragging equipment detectors are used to ascertain the presence and location of loose equipment on the undercarriage of train cars which can become jammed in tracks and cause derailments if not detected. As trains pass these detection devices, the readings from the detectors are transmitted by mobile radio to the crew members in the locomotive of the passing train and by telemetry links to the distant fixed-microwave transmitter which relays this information to the dispatcher at headquarters. In the event defects are detected, train crew personnel are required to stop the train, inspect it and take remedial action prior to resuming the journey. These devices are a key component of the railroad industry's program for preventing derailments and other types of accidents. Any interference to either the mobile or fixed-microwave links could prevent these critical communications from being transmitted to or received by the necessary components of the railroad system.

including co-frequency MSS downlinks. In an analogous setting, the critical nature of the railroads' use of mobile radio frequencies for safety and operational control and management of train movements was recognized explicitly by the FCC in its recent decision in the "refarming" proceeding, wherein the Commission granted special protection to railroad mobile radio channels due to their "quasi-public safety" nature in light of the potential threat of interference from non-railroad land mobile users.<sup>4/</sup> This recognition and protection must also be extended to the fixed links of the railroad radio systems because, as with any radio communications system, the reliability of the railroad industry's integrated mobile and fixed networks is only as good as the system's weakest link. If, having afforded special protection to the railroads' mobile links, the Commission were to allow interference from MSS downlink transmissions to jeopardize the FS links in the system, the Commission would undermine the laudable result it achieved in the "refarming" proceeding.

It is for these reasons that the railroad industry is vitally concerned about some of the recommendations proposed in the Commission's Further Notice regarding MSS/FS frequency sharing in the 2 GHz band.

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4/ Replacement of Part 90 by Part 88 to Revise the Private Land Mobile Radio Services and Modify the Policies Governing Them; and Examination of Exclusivity and Frequency Assignments Policies of the Private Land Mobile Services, PR Docket No. 92-235, FCC 97-61, Second Report and Order, ¶ 41 (released March 12, 1997) ("Refarming" proceeding).

**II. WHERE MSS/FS SHARING IS NOT FEASIBLE, THE COMMISSION SHOULD REQUIRE MSS PROVIDERS TO MAKE FS INCUMBENTS WHOLE BY PAYING ALL COSTS ASSOCIATED WITH RELOCATING TO COMPARABLE FACILITIES**

In the First Report and Order, the Commission correctly decided that MSS licensees must pay to relocate FS incumbents where FS systems receive harmful interference from, or cause harmful interference to, MSS systems. Where relocation is required, the Commission has proposed in the Further Notice that MSS operators "guarantee payment of all costs of relocating the incumbent to a comparable facility"<sup>5/</sup> and that, where MSS/FS sharing is not feasible, any relocation of FS incumbents be accomplished in accordance with the policies set forth in the Emerging Technologies proceeding.<sup>6/</sup> MSS providers will be required to pay all relocation costs, build the new microwave facilities at the relocation frequencies, and demonstrate that the new facilities are comparable to the relocated facilities.

In this connection, the Commission should ensure that FS incumbents who are forced to relocate their microwave facilities be made completely whole following relocation. This can be accomplished by requiring MSS operators to provide comparable facilities that match the overall throughput capacity and system reliability of existing facilities. The Commission should also decline, as it did in the PCS cost-

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<sup>5/</sup> Further Notice, ¶ 74.

<sup>6/</sup> Id. ¶ 74.

sharing proceeding, to consider the depreciation value of old equipment as a factor in determining the comparability of relocated facilities.<sup>7/</sup>

The Commission should make clear that the requirement to provide comparable facilities is not limited to making one-for-one equipment replacements. For instance, where replacement analog equipment is unavailable, existing analog systems may have to be replaced with digital systems. Moreover, because of the different propagation characteristics of radio signals operating in frequencies above 5 GHz, additional microwave repeater sites may have to be built between incumbents' existing facilities.

In summary, MSS operators should be required to provide comparable facilities to the extent necessary to ensure the complete restoration of the relocated incumbents' radio communication systems.

**III. THE COMMISSION SHOULD ABANDON THE TEN YEAR SUNSET PROPOSAL FOR REIMBURSEMENT OBLIGATIONS, OR ALTERNATIVELY, EXTEND IT TO REFLECT THE USEFUL LIFE OF EXISTING FACILITIES**

The Commission has proposed to adopt a ten-year sunset on the MSS provider's obligations to pay the costs of an incumbent's relocation.<sup>8/</sup> The railroads object to this proposal for three reasons. First, such a rule would have the unintended effect of delaying frequency band-clearing. Second, it would work against one of the primary objectives of any relocation rules -- to make incumbents whole. Third, the

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<sup>7/</sup> Amendment to the Commission's Rules Regarding a Plan for Sharing the Costs of Microwave Relocation, WT Docket No. 95-157, FCC 96-196, 11 FCC Rcd. 8825, ¶ 34 (1996) ("Cost-Sharing" proceeding).

<sup>8/</sup> Id. ¶ 74.

sunset approach is inconsistent with the Commission's policy of encouraging parties to share spectrum.

A ten-year sunset would delay band-clearing by encouraging MSS licensees to "wait out" incumbents in order to avoid having to pay relocation costs for comparable facilities. It would be grossly unfair to require incumbents to pay for their own relocation while MSS licensees reap an economic windfall directly from those relocations.

A ten-year sunset also fails to reflect the actual useful life of microwave equipment. For the railroads and other incumbents, the useful life of such equipment can be as long as 25 years. This means that, but for the mandatory relocation, incumbents would continue to operate their existing facilities after the sunset period. To allow MSS providers to demand that FS incumbents abandon equipment and facilities after the sunset period without having to pay incumbents' relocation expenses would be manifestly unfair and economically burdensome.

Finally, the concept of a sunset provision is antithetical to the Commission's stated policy of encouraging parties to find ways to share spectrum without interfering with each other. A sunset after a fixed date means that the incumbent FS operators would, at that time, be relegated to secondary status, would have no priority whatsoever in terms of interference protection, and would be legally obligated to abandon their operations in this band without compensation upon the demand of the MSS operator. Obviously this approach provides no incentive at all for the MSS operators to try to find ways to share spectrum so as to enable indefinite coexistence

with the FS users. If the Commission wishes to really encourage spectrum sharing, it should abandon the sunset concept and create a regulatory regime whereby (1) the 2.1 GHz incumbents retain their co-primary status indefinitely and (2) will be required to relocate to another band (at the expense of the MSS operator) only when it has been established that interference-free sharing (in both directions)<sup>9/</sup> involving a particular FS facility is not feasible.

In summary, the Commission should abandon the ten-year sunset proposal altogether and simply require MSS providers to relocate FS incumbents whenever sharing between the two services is not feasible. Alternatively, the Commission should modify its sunset proposal by extending the sunset period from 10 to 25 years to reflect the actual useful life of most microwave equipment.

**IV. THE COMMISSION SHOULD REQUIRE MSS PROVIDERS TO RELOCATE ALL PAIRED FS MICROWAVE FREQUENCIES, NOT JUST THOSE DIRECTLY SUSCEPTIBLE TO MSS DOWNLINK INTERFERENCE**

In the Further Notice, the Commission sought comment on procedures to relocate microwave incumbents with links in the 2130-2150 MHz band that are paired with links in the 2180-2200 MHz band (in which the MSS systems would operate). The Commission proposed to permit parties to negotiate the relocation of the paired links in the 2130-2150 MHz band during the voluntary and mandatory negotiation periods, and sought comment on whether it should require relocation of only the links in the

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<sup>9/</sup> "Interference-free sharing" means there is no interference to the FS system from the MSS system and no interference to the MSS system from the FS system.



2180-2200 MHz band in an involuntary relocation, leaving in place the paired links in the 2130-2150 MHz band.<sup>10/</sup>

For the railroads, relocation of FS links in the 2180-2200 MHz band will necessitate relocation of the paired links in the 2130-2150 MHz band. Railroad communications are two-directional -- one link in the frequency pair is used to transmit, the other to receive, the radio signals. The railroads are unaware of any equipment on the market that will permit one link in a frequency pair to operate in frequencies above 5 GHz while the other operates at 2 GHz. Even if such equipment were available, operating on two radically different radio frequency bands will pose serious technical and operational difficulties that will not only be expensive to resolve, but also could degrade overall performance. Separate antennas and interface equipment will be required to operate on each frequency band, which will, in turn, impose greater antenna spacing requirements and structural loading on existing towers.

For these reasons, the railroads will have no choice but to seek a frequency pairing in whatever relocated frequency bands are made available by the Commission. MSS providers should be required to pay for relocating frequency pairs when moving incumbents out of the 2180-2200 MHz band, whether during the proposed negotiating periods (both voluntary and mandatory), or pursuant to an "involuntary" relocation. Otherwise, the MSS industry will not be paying the full amount of the incumbents' total relocation expense.

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<sup>10/</sup> Id. ¶ 79.

**V. CONCLUSION**

For the reasons set out above, the railroad industry supports, with the modifications suggested herein, the Commission's proposal to adopt the relocation rules developed in the Emerging Technologies proceeding.

Respectfully submitted,

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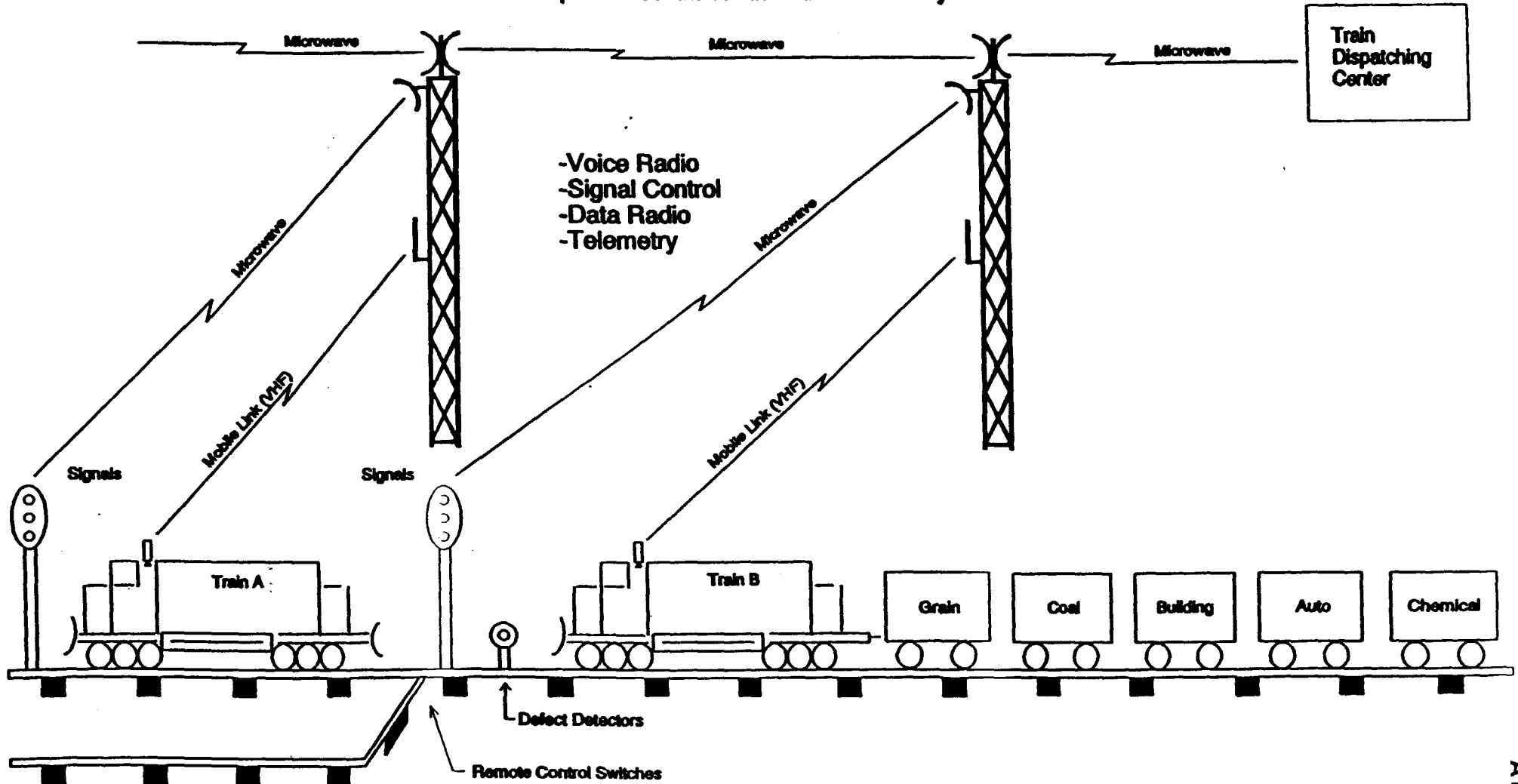
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Dated: June 23, 1997

Attachment

# Railroad Radio Systems

-are essential for safe, reliable, efficient rail transportation to interconnect train control systems.



Public safety is dependent on safe transportation.

Railroad freight transportation is critical to U.S. economy.

## **CERTIFICATE OF SERVICE**

The undersigned hereby certifies that on this 23rd day of June, 1997, caused copies of the foregoing "Comments" to be served by first class mail, postage prepaid to the following:

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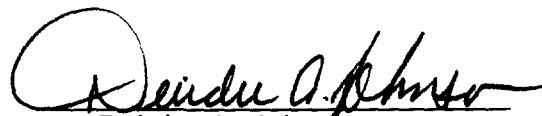
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